

### Table of Safe and Suitable Ingredients: Antimicrobials

For a complete listing refer to FSIS Directive 7120.1 Safe and Suitable Ingredients used in the Production of Meat, Poultry, and Egg Products <http://www.fsis.usda.gov/OPPDE/rdad/FSISDirectives/7120.1.pdf>

SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Acetic acid	Dried and fermented sausages	Use of up to 4 percent solution applied as a spray measured prior to application	Acceptability determination	None under the accepted conditions of use (1)
An aqueous solution of sodium diacetate (4%), lactic acid (4%), pectin (2%), and acetic acid (0.5%)	Cooked meat products	Not to exceed 0.5 percent of finished product formulation.	Acceptability determination	Listed by common or usual name in the ingredients statement (2)
An aqueous solution of sodium octanoate or octanoic acid and either glycerin and/or propylene glycol and/or a Polysorbate surface active agent (quantity sufficient to achieve the intended technical effect of octanoic acid emulsification) adjusted to a final solution pH of 1.5 to 4.0 using sodium hydroxide, potassium hydroxide, or an acceptable GRAS acid	Various non-standardized RTE meat and poultry products and standardized meat and poultry products that permit the use of any safe and suitable antimicrobial agent	Applied to the surface of the product at a rate not to exceed 400 ppm octanoic acid by weight of the finished food product	Acceptability determination	None under the accepted conditions of use (3)

(1) The use of the substance(s) is consistent with FDA's labeling definition of a processing aid. (2) Generally Recognized as Safe (GRAS).

(3) Secondary Direct Food Additive (4) Direct Food Additive. (5) Color Additive. (6) Food Contact Substance

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
An aqueous solution of sodium octanoate, potassium octanoate, or octanoic acid and either glycerin and/or propylene glycol and/or a Polysorbate surface active agent (quantity sufficient to achieve the intended technical effect of octanoic acid emulsification) adjusted to a final solution pH of 1.5 to 6.0 using sodium hydroxide, potassium hydroxide, or an acceptable GRAS acid	Fresh meat primals and subprimals and cuts	Applied to the surface of the product at a rate not to exceed 400 ppm octanoic acid by weight of the final product	Acceptability determination	None under the accepted conditions of use (3)
A blend of citric acid and sorbic acid in a 2:1 ratio	To reduce the microbial load of purge trapped inside soaker pads in packages of raw whole muscle cuts of meat and poultry	Incorporated into soaker pads at a level not to exceed 1 to 3 grams per pad	Acceptability determination	None under the accepted conditions of use (1)
A blend of lactic acid (45-60%), citric acid (20-35%), and potassium hydroxide (>1%)	Beef, pork, and lamb carcasses, heads, and organs including unskinned livers, tongues, tails, primal cuts, sub-primal cuts, cuts, and trimmings	Applied as a spray at a level not to exceed 2.5% solution by weight. Organ meat products must be drained for a minimum of 1-2 minutes after application before packaging.	Acceptability determination	None under the accepted conditions of use (1)

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
A blend of salt, sodium acetate, lemon extract, and grapefruit extract	Ground beef, cooked, cured, comminuted sausages (e.g., bologna), and RTE whole muscle meat products	Not to exceed 0.5 percent of the product formulation	Acceptability determination	Listed by common or usual name in the ingredients statement for the RTE whole muscle meat products, and cooked, cured, comminuted sausages. Ground beef must be descriptively labeled (4)
A blend of salt, sodium acetate, lemon extract, and grapefruit extract	Beef steaks	Steaks that are sliced, scored and dipped in a solution containing 2.5 percent of the blend	Acceptability determination	Product must be descriptively labeled (4)
A blend of salt, lemon extract, and grapefruit extract	Ground beef	Not to exceed 0.5 percent of the product formulation	Acceptability determination	Product must be descriptively labeled (4)
A blend of salt, lactic acid, sodium diacetate, and mono- and diglycerides	Various non-standardized RTE meat and poultry products and standardized meat and poultry products that permit the use of any safe and suitable antimicrobial agent	Not to exceed 0.2 percent of product formulation	Acceptability determination	All ingredients, except for the mono- and diglycerides, must be listed by common or usual name in the ingredients statement (4)

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
A mixture of hops beta acids, egg white lysozyme, and cultured skim milk	In a salad dressing used in refrigerated meat and poultry deli salads	Not to exceed 1.5 percent of the finished salad	Acceptability determination	Listed by common or usual name in the ingredients statement (2)
A mixture of maltodextrin (DE of 5 or greater), cultured dextrose, sodium diacetate, egg white lysozyme, and nisin preparation	In salads, sauces, and dressings to which fully cooked meat or poultry will be added	Not to exceed 1.5 percent by weight of the finished product	Acceptability determination	Listed by common or usual name in the ingredients statement -4
Acidified sodium chlorite	Poultry carcasses and parts; meat carcasses, parts, and organs; processed, comminuted, or formed meat food products (including RTE)	500 to 1200 ppm in combination with any GRAS acid at a level sufficient to achieve a pH of 2.3 to 2.9 in accordance with 21 CFR 173.325 Note: The pH depends on the type of meat or poultry product.	21 CFR 173.325	None under the accepted conditions of use (3)
Acidified sodium chlorite	Processed, comminuted or formed poultry products (including RTE)	500 to 1200 ppm in combination with any GRAS acid at a level sufficient to achieve a pH of 2.3 to 2.9 in accordance with 21 CFR 173.325 (Note: The pH depends on the type of meat or poultry product.)	Acceptability determination	None under the accepted conditions of use (3)

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Acidified sodium chlorite	Poultry carcasses, parts, trim, and organs	Mixing an aqueous solution of sodium chlorite with any GRAS acid to achieve a pH of 2.2 to 3.0 then further diluting this solution with a pH elevating agent (i.e., sodium bicarbonate, sodium carbonate, or an un-acidified sodium chlorite solution) to a final pH of 5.0 to 7.5. When used in a spray or dip the final sodium chlorite concentration does not exceed 1200 mg/kg and the chlorine dioxide concentration does not exceed 30 mg/kg. When used in a pre-chiller or chiller solution on poultry carcasses and parts the additive is used at a level that results in sodium chlorite concentrations between 50 and 150 ppm. Contact times may be up to several minutes at temperatures between 0 and 15 degrees C.	Food Contact Substance Notification No. FCN 739	None under the accepted conditions of use (6)

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Acidified sodium chlorite	Red meat, red meat parts and organs, and on processed, comminuted, formed meat products (including RTE)	Applied as a spray or dip, the additive is produced by mixing an aqueous solution of sodium chlorite with any GRAS acid to achieve a pH in the range of 2.2 to 3.0, then further diluting this solution with a pH elevating agent such that the resultant sodium chlorite concentration does not exceed 1200 ppm, and the chlorine dioxide concentration does not exceed 30 ppm. The pH of the use solution is between 5.0 and 7.5	Food Contact Substance Notification No. FCN 450	None under the accepted conditions of use (6)
Ammonium hydroxide	Beef carcasses (in hot boxes and holding coolers) and boneless beef trimmings	In accordance with current industry standards of good manufacturing practice	Acceptability determination	None under the accepted conditions of use (1)
Anhydrous ammonia	Lean finely textured beef which is subsequently quick chilled to 28 degrees Fahrenheit and mechanically "stressed"	In accordance with current industry standards of good manufacturing practice	Acceptability determination	None under the accepted conditions of use (1)
Anhydrous ammonia	Ground beef	Followed with carbon dioxide treatment in accordance with current industry standards of good manufacturing practice	Acceptability determination	None under the accepted conditions of use (1)

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Bacteriophage preparation (Salmonella targeted)	On the hides of live animals in the holding pens prior to slaughter	Applied as a spray mist or wash	Acceptability determination	None under the accepted conditions of use (1)
Bacteriophage preparation (E. coli O157:H7 targeted)	On the hides of live animals in the holding pens prior to slaughter	Applied as a spray mist or wash	Acceptability determination	None under the accepted conditions of use (1)
Bacteriophage preparation (Salmonella targeted)	On the feathers of live poultry prior to slaughter	Applied as a spray mist or wash	Acceptability determination	None under the accepted conditions of use (1)

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Bacteriophage preparation (a mixture of equal proportions of six different individually purified lytic-type bacteriophages specific against <i>Listeria monocytogenes</i> )	Various RTE meat and poultry products	Applied as a spray at a level not to exceed 1 ml of the additive per 500 cm <sup>2</sup> product surface area	21 CFR 172.785	Listed by common or usual name (i.e., bacteriophage preparation) in the ingredients statement of non-standardized meat and poultry products and standardized meat and poultry products that permit the use of any safe and suitable antimicrobial agent. Standardized meat and poultry products that do not permit the use of any safe and suitable antimicrobial agent must be descriptively labeled. (4)

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Bacteriophage preparation	Various RTE meat and poultry products	Applied to the surface of the product to achieve a level of $1 \times 10^7$ to $1 \times 10^9$ plaque forming units (pfu) per gram of product	GRAS Notice No. 000218	None under the accepted conditions of use (1). Standardized meat and poultry products that do not permit the use of any safe and suitable antimicrobial agent must be descriptively labeled. (4)
Bacteriophage preparation	Red meat parts and trim prior to grinding	Applied as a mixture diluted with water at a ratio of 1:10. Application rate of approximately 2 ml diluted solution per 500 cm <sup>2</sup> of surface area may be used	FCN No. 1018	None under the accepted conditions of use. (1)
Calcium hypochlorite	Red meat carcasses down to a quarter of a carcass	Applied as a spray at a level not to exceed 50 ppm calculated as free available chlorine measured prior to application	Acceptability determination	None under the accepted conditions of use (1)
Calcium hypochlorite	On whole or eviscerated poultry carcasses	Applied as a spray at a level not to exceed 50 ppm calculated as free available chlorine measured prior to application	Acceptability determination	None under the accepted conditions of use (1)

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Calcium hypochlorite	In water used in meat processing	Not to exceed 5 ppm calculated as free available chlorine	Acceptability determination	None under the accepted conditions of use (1)
Calcium hypochlorite	In water used in poultry processing (except for product formulation)	Not to exceed 50 ppm calculated as free available chlorine	Acceptability determination	None under the accepted conditions of use (1)
Calcium hypochlorite	Poultry chiller water	Not to exceed 50 ppm calculated as free available chlorine (measured in the incoming potable water)	Acceptability determination	None under the accepted conditions of use (1)
Calcium hypochlorite	Poultry chiller red water (i.e., poultry chiller water re-circulated, usually through heat exchangers, and reused back in the chiller)	Not to exceed 5 ppm calculated as free available chlorine (measured at influent to chiller)	Acceptability determination	None under the accepted conditions of use (1)
Calcium hypochlorite	Reprocessing contaminated poultry carcasses	20 ppm calculated as free available chlorine Note: Agency guidance has allowed the use of up to 50 ppm calculated as free available chlorine	9 CFR 381.91	None under the accepted conditions of use (1)
Calcium hypochlorite	On giblets (e.g., livers, hearts, gizzards, and necks) and salvage parts	Not to exceed 50 ppm calculated as free available chlorine in the influent to a container for chilling.	Acceptability determination	None under the accepted conditions of use (1)

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Calcium hypochlorite	Beef primals	20 ppm calculated as free available chlorine	Acceptability determination	None under the accepted conditions of use (1)
<i>Carnobacterium maltaromaticum</i> strain CB1	Ready-to-eat comminuted meat products (e.g., hot dogs)	Applied as a spray to meat products at a maximum concentration of at inoculation of $1 \times 10^4$ colony forming units per gram (cfu/g)	GRAS Notice No. 000159	Listed as " <i>Carnobacterium maltaromaticum</i> " or "bacterial culture" in the ingredients statement (2)
<i>Carnobacterium maltaromaticum</i> strain CB1 (viable and heat-treated)	Ready-to-eat meat products; meat and poultry products	Viable CB1 applied at levels up to $1 \times 10^9$ colony forming units per gram (cfu/g). Heat-treated CB1 applied at levels up to 5000 (typically between 1000-5000) parts per million (ppm)	GRAS Notice No. 000305	Listed as " <i>Carnobacterium maltaromaticum</i> " or "bacterial culture" in the ingredients statement (2)
Cetylpyridinium chloride	To treat the surface of raw poultry carcasses or giblets prior to immersion in a chiller	Applied as a fine mist spray of an ambient temperature aqueous solution. The aqueous solution shall also contain propylene glycol complying with 21 CFR 184.1666 at a concentration of 1.5 times that of the cetylpyridinium chloride	21 CFR 173.375	None under the accepted conditions of use (3)

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Cetylpyridinium chloride	To treat the surface of raw poultry carcasses or giblets either prior to or after chilling	Not to exceed 5 gallons of solution per carcass provided that the additive is used in systems that recapture at least 99 percent of the solution that is applied to the poultry carcasses. The concentration of cetylpyridinium chloride in the solution applied to the carcasses shall not exceed 0.8 percent by weight. The aqueous solution shall also contain propylene glycol complying with 21 CFR 184.1666 at a concentration of 1.5 times that of cetylpyridinium chloride. When application of the additive is not followed by immersion in a chiller, the treatment will be followed by a potable water rinse of the carcass.	21 CFR 173.375	None under the accepted conditions of use (3)
Chlorine gas	Red meat carcasses down to a quarter of a carcass	Applied as a spray at a level not to exceed 50 ppm calculated as free available chlorine measured prior to application	Acceptability determination	None under the accepted conditions of use (1)

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Chlorine gas	On whole or eviscerated poultry carcasses	Applied as a spray at a level not to exceed 50 ppm calculated as free available chlorine measured prior to application	Acceptability determination	None under the accepted conditions of use (1)
Chlorine gas	In water used in meat processing	Not to exceed 5 ppm calculated as free available chlorine	Acceptability determination	None under the accepted conditions of use (1)
Chlorine gas	In water used in poultry processing (except for product formulation)	Not to exceed 50 ppm calculated as free available chlorine	Acceptability determination	None under the accepted conditions of use (1)
Chlorine gas	Poultry chiller water	Not to exceed 50 ppm calculated as free available chlorine (measured in the incoming potable water)	Acceptability determination	None under the accepted conditions of use (1)
Chlorine gas	Poultry chiller red water (i.e., poultry chiller water re-circulated, usually through heat exchangers, and reused back in the chiller)	Not to exceed 5 ppm calculated as free available chlorine (measured at influent to chiller)	Acceptability determination	None under the accepted conditions of use (1)
Chlorine gas	Reprocessing contaminated poultry carcasses	20 ppm calculated as free available chlorine Note: Agency guidance has allowed the use of up to 50 ppm calculated as free available chlorine	9 CFR 381.91	None under the accepted conditions of use (1)

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Chlorine gas	On giblets (e.g., livers, hearts, gizzards, and necks) and salvage parts	Not to exceed 50 ppm calculated as free available chlorine in the influent to a container for chilling.	Acceptability determination	None under the accepted conditions of use (1)
Chlorine gas	Beef primals	20 ppm calculated as free available chlorine	Acceptability determination	None under the accepted conditions of use (1)
Citric acid	Bologna in an edible casing	Up to a 10 percent solution applied prior to slicing	Acceptability determination	Listed by common or usual name in the ingredients statement -4
Citric acid	Bologna in an inedible casing	Up to a 10 percent solution applied prior to slicing	Acceptability determination	None under the accepted conditions of use (1)
Citric acid	Fully cooked meat and poultry products in impermeable and permeable pre-stuck casings.	Up to a 3 percent solution is applied to the casing just prior to removal.	Acceptability determination	None under the accepted conditions of use (1)
Citric acid	Separated beef heads and associated offal products (e.g., hearts, livers, tails, tongues)	A 2.5 percent solution applied as a spray prior to chilling	Acceptability determination	None under the accepted conditions of use (1)

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Citric acid	In brine to cool fully-cooked RTE meat products (a) sausages and similar products in natural casings (including permeable casings), (b) hams in permeable casings/netting prior to the removal of the casing/netting	Up to 3 percent of the brine solution	Acceptability determination	None under the accepted conditions of use (1)
Chlorine dioxide	In water used in poultry processing	Not to exceed 3 ppm residual chlorine dioxide as determined by Method 4500-ClO <sub>2</sub> E in the "Standard Methods for the Examination of Water and Wastewater," 18 <sup>th</sup> ed., 1992, or an equivalent method	21 CFR 173.300	None under the accepted conditions of use (3)

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Chlorine dioxide	In water used in poultry processing	Not to exceed 3 ppm residual chlorine dioxide as determined by Method 4500-CIO <sub>2</sub> -D, modified for use with the Hach Spectrophotometer, or UV absorbance at 360 nm. (2) Chlorine dioxide produced through the "CLOSURE" process produces a concentrated solution that contains at least 600 ppm chlorine dioxide, and no greater than 10 ppm chlorite and 90 ppm chlorate	Food Contact Substance Notification No. FCN 644	None under the accepted conditions of use (6)
Chlorine dioxide	In water used in poultry processing	Not to exceed 3 ppm residual chlorine dioxide as determined by Method 4500-CIO <sub>2</sub> E in the "Standard Methods for the Examination of Water and Wastewater," 20 <sup>th</sup> ed., 1998, or an equivalent method	Food Contact Substance Notification No. FCN 1011	None under the accepted conditions of use (6)

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Chlorine dioxide	Red meat, red meat parts and organs; processed, comminuted, or formed meat food products	Applied as a spray or dip at a level not to exceed 3 ppm residual chlorine dioxide as determined by Method 4500-CIO <sub>2</sub> E in the "Standard Methods for the Examination of Water and Wastewater," 18 <sup>th</sup> ed., 1992, or an equivalent method	Food Contact Substance Notification No. FCN 668	None under the accepted conditions of use (6)
Chlorine dioxide	Red meat, red meat parts and organs; processed, comminuted, or formed meat food products	Applied as a spray or dip at a level not to exceed 3 ppm residual chlorine dioxide as determined by Method 4500-CIO <sub>2</sub> E in the "Standard Methods for the Examination of Water and Wastewater," 20 <sup>th</sup> ed., 1998, or an equivalent method	Food Contact Substance Notification No. FCN 1052	None under the accepted conditions of use (6)
Cultured Sugar (derived from corn, cane, or beets)	In enhanced meat and poultry products (e.g., beef or pork injected with a solution) and RTE meat and poultry products (e.g., hot dogs and cooked turkey breast)	At up to 4.8 percent of the product formula	GRAS Notice No. 000240	Cultured cane and beet sugar listed by common or usual name (e.g., "cultured cane sugar") Cultured corn sugar listed as "cultured corn sugar or "cultured dextrose."

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Cultured Sugar and Vinegar (derived from corn, cane, or beets)	In enhanced meat and poultry products (e.g., beef or pork injected with a solution) and RTE meat and poultry products (e.g., hot dogs and cooked turkey breast)	At up to 4.8 percent of the product formula	Acceptability determination	Cultured cane and beet sugar listed by common or usual name and vinegar (e.g., "cultured cane sugar, vinegar" or "cultured sugar, vinegar")
DBDMH (1,3-dibromo-5,5-dimethylhydantoin)	For use in poultry chiller water and in water applied to poultry via an Inside-Outside Bird Washer (IOBW) and in water used in poultry processing for poultry carcasses, parts, and organs	At a level not to exceed that needed to provide the equivalent of 100 ppm active bromine	Food Contact Substance Notification No. FCN 334 and FCN 453	None under the accepted conditions of use (6)
DBDMH (1,3-dibromo-5,5-dimethylhydantoin)	For use in water supplied to ice machines to make ice intended for general use in poultry processing	At a level not to exceed that needed to provide the equivalent of 100 ppm of available bromine (corresponding to a maximum level of 90 mg DBDMH/kg water)	Food Contact Substance Notification No. FCN 775	None under the accepted conditions of use (6)
DBDMH (1,3-dibromo-5,5-dimethylhydantoin)	For use in water applied to beef hides, carcasses, heads, trim, parts, and organs.	At a level not to exceed that needed to provide the equivalent of 300 ppm active bromine.	Food Contact Substance Notification No. FCN 792	None under the accepted conditions of use (6)

(1) The use of the substance(s) is consistent with FDA's labeling definition of a processing aid. (2) Generally Recognized as Safe (GRAS).

(3) Secondary Direct Food Additive (4) Direct Food Additive. (5) Color Additive. (6) Food Contact Substance

## Table of Safe and Suitable Ingredients: Antimicrobials

For a complete listing refer to FSIS Directive 7120.1 Safe and Suitable Ingredients used in the Production of Meat, Poultry, and Egg Products <http://www.fsis.usda.gov/OPPDE/rdad/FSISDirectives/7120.1.pdf>

SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
DBDMH (1,3-dibromo-5,5-dimethylhydantoin)	For use in water applied to swine, goat, and sheep carcasses and their parts and organs	At a level not to exceed that needed to provide the equivalent of 500 ppm of available bromine	Food Contact Substance Notification No. FCN 1102	None under the accepted conditions of use (6)
Egg white lysozyme	In casings and on cooked (RTE) meat and poultry products	2.5 mg per pound in the finished product when used in casings; 2.0 mg per pound on cooked meat and poultry products	GRAS Notice No. 000064	Listed by common or usual name in the ingredients statement (2)
Electrolytically generated hypochlorous acid	Red meat carcasses down to a quarter of a carcass	Applied as a spray at a level not to exceed 50 ppm calculated as free available chlorine measured prior to application	Acceptability determination	None under the accepted conditions of use (1)
Electrolytically generated hypochlorous acid	On whole or eviscerated poultry carcasses	Applied as a spray at a level not to exceed 50 ppm calculated as free available chlorine measured prior to application	Acceptability determination	None under the accepted conditions of use (1)
Electrolytically generated hypochlorous acid	In water used in meat processing	Not to exceed 5 ppm calculated as free available chlorine	Acceptability determination	None under the accepted conditions of use (1)
Electrolytically generated hypochlorous acid	In water used in poultry processing (except for product formulation)	Not to exceed 50 ppm calculated as free available chlorine	Acceptability determination	None under the accepted conditions of use (1)

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(3) Secondary Direct Food Additive (4) Direct Food Additive. (5) Color Additive. (6) Food Contact Substance

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Electrolytically generated hypochlorous acid	Poultry chiller water	Not to exceed 50 ppm calculated as free available chlorine (measured in the incoming potable water)	Acceptability determination	None under the accepted conditions of use (1)
Electrolytically generated hypochlorous acid	Poultry chiller red water (i.e., poultry chiller water re-circulated, usually through heat exchangers, and reused back in the chiller)	Not to exceed 5 ppm calculated as free available chlorine (measured at influent to chiller)	Acceptability determination	None under the accepted conditions of use (1)
Electrolytically generated hypochlorous acid	Reprocessing contaminated poultry carcasses	20 ppm calculated as free available chlorine Note: Agency guidance has allowed the use of up to 50 ppm calculated as free available chlorine	9 CFR 381.91	None under the accepted conditions of use (1)
Electrolytically generated hypochlorous acid	On giblets (e.g., livers, hearts, gizzards, and necks) and salvage parts	Not to exceed 50 ppm calculated as free available chlorine in the influent to a container for chilling.	Acceptability determination	None under the accepted conditions of use (1)
Electrolytically generated hypochlorous acid	Beef primals	20 ppm calculated as free available chlorine	Acceptability determination	None under the accepted conditions of use (1)
An aqueous solution of citric and hydrochloric acids adjusted to a pH of 1.0 to 2.0	Poultry carcasses, parts, trim, and organs	Applied as a spray or dip with a minimum contact time of 2 to 5 seconds pH measured prior to application	Acceptability determination	None under the accepted conditions of use (1)

(1) The use of the substance(s) is consistent with FDA's labeling definition of a processing aid. (2) Generally Recognized as Safe (GRAS).

(3) Secondary Direct Food Additive (4) Direct Food Additive. (5) Color Additive. (6) Food Contact Substance

### Table of Safe and Suitable Ingredients: Antimicrobials

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
An aqueous solution of citric and hydrochloric acids adjusted to a pH of 0.5 to 2.0	Meat carcasses, parts, trim, and organs	Applied as a spray or dip for a contact time of 2 to 5 seconds pH measured prior to application	Acceptability determination	None under the accepted conditions of use (1)
A blend of citric acid (1.87%), phosphoric acid (1.72%), and hydrochloric acid (0.8%)	Poultry carcasses	Applied as a spray with a minimum contact time of 1 to 2 seconds and allowed to drip from the carcasses for 30 seconds	Acceptability determination	None under the accepted conditions of use (1)
Hops beta acids	In casings and on cooked (RTE) meat and poultry products	2.5 mg per pound in the finished product when used in casings; 2.0 mg per pound on cooked meat and poultry products	GRAS Notice No. 000063	Listed by common or usual name in the ingredients statement (2)

(1) The use of the substance(s) is consistent with FDA's labeling definition of a processing aid. (2) Generally Recognized as Safe (GRAS).

(3) Secondary Direct Food Additive (4) Direct Food Additive. (5) Color Additive. (6) Food Contact Substance

## Table of Safe and Suitable Ingredients: Antimicrobials

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Hypobromous acid	In water or ice used for processing meat and poultry products	Generated on-site from an aqueous mixture of hydrogen bromide and sodium, potassium, or calcium hypochlorite for use at a level not to exceed that needed to provide 300 ppm available bromine (or 133 ppm available chlorine*) in water or ice applied to meat products, and 200 ppm available bromine (or 89 ppm available chlorine*) in water or ice applied to poultry products. *(NOTE: Because there are a limited number of commercial test kits specific for bromine, chlorine kits may be used. The ppm levels between available bromine and chlorine is due to the difference in their molecular weight.)	Food Contact Substance Notification No. FCN 000944	None under the accepted conditions of use (6)

(1) The use of the substance(s) is consistent with FDA's labeling definition of a processing aid. (2) Generally Recognized as Safe (GRAS).

(3) Secondary Direct Food Additive (4) Direct Food Additive. (5) Color Additive. (6) Food Contact Substance

## Table of Safe and Suitable Ingredients: Antimicrobials

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Hypobromous acid	In water or ice used for processing meat products	Generated on-site from an aqueous mixture of sodium bromide and sodium, potassium, or calcium hypochlorite for use at a level not to exceed that needed to provide 900 ppm available bromine (or 400 ppm available chlorine*) in water or ice applied to meat products, and 200 ppm available bromine (or 89 ppm available chlorine*) in water or ice applied to poultry products. *(NOTE: Because there are a limited number of commercial test kits specific for bromine, chlorine kits may be used. The ppm levels between available bromine and chlorine is due to the difference in their molecular weight.)	Food Contact Substance Notification No. FCN 001122	None under the accepted conditions of use (6)

(1) The use of the substance(s) is consistent with FDA's labeling definition of a processing aid. (2) Generally Recognized as Safe (GRAS).

(3) Secondary Direct Food Additive (4) Direct Food Additive. (5) Color Additive. (6) Food Contact Substance

## Table of Safe and Suitable Ingredients: Antimicrobials

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Hypobromous acid	In water or ice used for processing meat products	Generated on-site from an aqueous mixture of hydrogen bromide and sodium, potassium, or calcium hypochlorite for use at a level not to exceed that needed to provide 900 ppm available bromine (or 400 ppm available chlorine*) in water or ice applied to meat products. *(NOTE: Because there are a limited number of commercial test kits specific for bromine, chlorine kits may be used. The ppm levels between available bromine and chlorine is due to the difference in their molecular weight.)	Food Contact Substance Notification No. FCN 0001036	None under the accepted conditions of use (6)
Hypobromous acid	In water or ice used for processing poultry products	Generated on-site from an aqueous mixture of hydrogen bromide and sodium, potassium, or calcium hypochlorite for use at a level not to exceed that needed to provide 450 ppm available bromine or 200 ppm available chlorine	Food Contact Substance Notification No. FCN 0001098	None under the accepted conditions of use (6)

(1) The use of the substance(s) is consistent with FDA's labeling definition of a processing aid. (2) Generally Recognized as Safe (GRAS).

(3) Secondary Direct Food Additive (4) Direct Food Additive. (5) Color Additive. (6) Food Contact Substance



## Table of Safe and Suitable Ingredients: Antimicrobials

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Hypobromous acid	In water or ice, used as either a spray or a dip, for meat (hides on or off) or poultry processing	Generated on-site from an aqueous mixture of hydrogen bromide and sodium, potassium, or calcium hypochlorite for use at a level not to exceed that needed to provide 300 ppm total bromine (182 ppm HOBr) (or 133 ppm total chlorine*) in water or ice applied to meat products. At a level not to exceed 200 ppm total bromine (121 ppm HOBr) (or 90 ppm total chlorine*) in water or ice applied to poultry products. *(NOTE: Because there are a limited number of commercial test kits specific for bromine, chlorine kits may be used. The ppm levels between available bromine and chlorine is due to the difference in their molecular weight.)	Food Contact Substance Notification No. FCN 0001106	None under the accepted conditions of use (6)
Lactic Acid	Livestock carcasses prior to fabrication (i.e., pre- and post-chill), offal, and variety meats	Up to a 5 percent lactic acid solution	Acceptability determination	None under the accepted conditions of use (1)

(1) The use of the substance(s) is consistent with FDA's labeling definition of a processing aid. (2) Generally Recognized as Safe (GRAS).

(3) Secondary Direct Food Additive (4) Direct Food Additive. (5) Color Additive. (6) Food Contact Substance

## Table of Safe and Suitable Ingredients: Antimicrobials

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Lactic Acid	Beef and pork sub-primals and trimmings	2 percent to 5 percent solution of lactic acid not to exceed 55°C	Acceptability determination	None under the accepted conditions of use (1)
Lactic Acid	Beef heads and tongues	A 2.0 to 2.8 percent solution applied to brushes in a washer cabinet system used to clean beef heads and tongues	Acceptability determination	None under the accepted conditions of use (1)
Lactic Acid	Poultry carcasses, meat, parts, trim and giblets	Up to 5% lactic acid solution on post chill poultry carcasses, meat, parts, trim and giblet.	Acceptability determination	None under the accepted conditions of use (1)
Lactic acid bacteria mixture consisting of <i>Lactobacillus acidophilus</i> (NP35, NP51), <i>Lactobacillus lactis</i> (NP7), and <i>Pediococcus acidilactici</i> (NP3)	RTE cooked sausages (e.g., frankfurters, bologna, etc.) and cooked, cured whole muscle products (e.g., ham)	Applied by dipping product into a solution containing 10 <sup>7</sup> colony forming units lactobacilli per ml	Acceptability determination	Listed by common or usual name in the ingredients statement (2)
Lactic acid bacteria mixture consisting of <i>Lactobacillus acidophilus</i> (NP35, NP51), <i>Lactobacillus lactis</i> (NP7), and <i>Pediococcus acidilactici</i> (NP3)	Poultry carcasses and fresh whole muscle cuts and chopped/ground poultry	10 <sup>5</sup> to 10 <sup>6</sup> colony forming units of lactobacilli per gram of product	Acceptability determination	Listed by common or usual name in the ingredients statement of non-standardized products. Single ingredient raw products must be descriptively labeled (2)

(1) The use of the substance(s) is consistent with FDA's labeling definition of a processing aid. (2) Generally Recognized as Safe (GRAS).

(3) Secondary Direct Food Additive (4) Direct Food Additive. (5) Color Additive. (6) Food Contact Substance

### Table of Safe and Suitable Ingredients: Antimicrobials

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Lactic acid bacteria mixture consisting of <i>Lactobacillus acidophilus</i> (NP35, NP51), <i>Lactobacillus lactis</i> (NP7), and <i>Pediococcus acidilactici</i> (NP3)	Non-standardized comminuted meat products (e.g., beef patties), ground beef, and raw whole muscle beef cuts	10 <sup>6</sup> to 10 <sup>8</sup> colony forming units of lactobacilli per gram of product	GRAS Notice No. 000171	Listed by common or usual name in the ingredients statement of non-standardized comminuted meat products. Ground beef and raw whole muscle beef cuts must be descriptively labeled (2)
Lactoferrin	Beef carcasses and parts	At up to 2 percent of a water-based antimicrobial spray	GRAS Notice No. 000067	Listed by common or usual name in ingredients statement (2)
Lactoferrin	Beef carcasses	As part of an antimicrobial spray that would deliver 1 gram of lactoferrin per dressed beef carcass, followed by a wash with tempered water and rinse with lactic acid	GRAS Notice No. 000130	None under the accepted conditions of use (1)

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(3) Secondary Direct Food Additive (4) Direct Food Additive. (5) Color Additive. (6) Food Contact Substance

## Table of Safe and Suitable Ingredients: Antimicrobials

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Lauramide arginine ethyl ester (LAE), silicon dioxide, and refined sea salt	Non-standardized RTE comminuted meat products and standardized RTE comminuted meat products that permit the use of any safe and suitable antimicrobial agent	Not to exceed 200 ppm LAE by weight of the finished product	Acceptability determination	Listed by common or usual name (i.e., lauric arginate, refined sea salt) in the ingredients statement (2)
Lauramide arginine ethyl ester (LAE), silicon dioxide, and refined sea salt	Fresh cuts of meat and poultry; and, non-standardized, non-comminuted RTE meat and poultry products and standardized, non-comminuted RTE meat and poultry products that permit the use of any safe and suitable antimicrobial agent	Not to exceed 200 ppm LAE, 67 ppm silicon dioxide, and 1640 ppm refined sea salt by weight of the finished product	Acceptability determination	Listed by common or usual name (i.e., lauric arginate, silicon dioxide, refined sea salt) in the ingredients statement (2) When applied to the surface of fresh cuts of meat and poultry none under the accepted conditions of use (1)

(1) The use of the substance(s) is consistent with FDA's labeling definition of a processing aid. (2) Generally Recognized as Safe (GRAS).

(3) Secondary Direct Food Additive (4) Direct Food Additive. (5) Color Additive. (6) Food Contact Substance

## Table of Safe and Suitable Ingredients: Antimicrobials

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Lauramide arginine ethyl ester (LAE) dissolved at specified concentrations in either propylene glycol, glycerin, or water to which may be added a Polysorbate surface active agent (quantity sufficient to achieve the intended technical effect of LAE emulsification)	Non-standardized RTE comminuted meat products and standardized RTE comminuted meat products that permit the use of any safe and suitable antimicrobial agent	Not to exceed 200 ppm LAE by weight of the finished product	Acceptability determination	Listed by common or usual name (i.e., lauric arginate) in the ingredients statement (2)
Lauramide arginine ethyl ester (LAE) dissolved at specified concentrations in either propylene glycol, glycerin, or water to which may be added a Polysorbate surface active agent (quantity sufficient to achieve the intended technical effect of LAE emulsification)	Fresh cuts of meat and poultry and various non-standardized RTE meat and poultry products and standardized RTE meat and poultry products that permit the use of any safe and suitable antimicrobial agent	Applied to the surface of the product at a rate not to exceed 200 ppm LAE by weight of the finished food product	GRAS Notice No. 000164	When applied to the surface of RTE products listed by common or usual name (i.e., lauric arginate) in the ingredients statement (2) When applied to the surface of fresh cuts of meat and poultry none under the accepted conditions of use (1)

(1) The use of the substance(s) is consistent with FDA's labeling definition of a processing aid. (2) Generally Recognized as Safe (GRAS).

(3) Secondary Direct Food Additive (4) Direct Food Additive. (5) Color Additive. (6) Food Contact Substance

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Lauramide arginine ethyl ester (LAE)	RTE meat and poultry products; raw pork sausage	Applied to the inside of the package or to product surfaces at up to 44 ppm (with a process tolerance of 20 percent, allowing for an LAE concentration not to exceed 53 ppm) by weight of the finished food product	Acceptability determination	None under the accepted conditions of use (1)
Lauramide arginine ethyl ester (LAE) dissolved at specified concentrations in either propylene glycol, glycerin, or water to which may be added a Polysorbate surface active agent (quantity sufficient to achieve the intended technical effect of LAE emulsification)	Ground poultry	Applied in a mixer, blender, or tumbler designed to mix and/or blend other ingredients into ground poultry at a level not to exceed 200 ppm by weight in the finished product. The LAE is sprayed with a metered dose into the mixer, blender, or tumbler as the product is being mixed, blended, or tumbled	Acceptability determination	None under the accepted conditions of use (1)
Lauramide arginine ethyl ester (LAE)	Ground beef	Applied at a level not to exceed 200 ppm by weight in the finished product	Acceptability determination	None under the accepted conditions of use (1)
Nisin preparation	Cooked, RTE meat and poultry products containing sauces	Not to exceed 600 ppm nisin preparation in the finished product	Acceptability determination	Listed by common or usual name in the ingredients statement (2)

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(3) Secondary Direct Food Additive (4) Direct Food Additive. (5) Color Additive. (6) Food Contact Substance

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Nisin preparation	Meat and poultry soups	Not to exceed 5 ppm of the product formulation	Acceptability determination	Listed by common or usual name in the ingredients statement (2)
Nisin preparation	In casings and on cooked (RTE) meat and poultry products	3.15 mg per pound in the finished product when used in casings; 2.5 mg per pound on cooked meat and poultry products	GRAS Notice No. 000065	Listed by common or usual name in the ingredients statement (2)
Nisin preparation	Egg products	Not to exceed 250 ppm in formulated product	Acceptability determination	Listed by common or usual name in the ingredients statement (2)
A blend of encapsulated nisin preparation (90.9 percent), rosemary extract (8.2 percent) and salt (0.9 percent)	Frankfurters and other similar cooked meat and poultry sausages	Not to exceed 550 ppm of the product formulation	Acceptability determination	Listed by common or usual name in the ingredients statement (4)
A blend of nisin preparation, rosemary extract, salt, maltodextrin, and cultured dextrose	Cooked (RTE) meat and poultry sausages and cured meat products	Not to exceed 0.55 percent of product formulation in cooked (RTE) meat and poultry sausages and 0.7 percent of product formulation in cured meat products (where the nisin preparation will not exceed 250 ppm)	Acceptability determination	Listed by common or usual name in the ingredients statement (4)

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(3) Secondary Direct Food Additive (4) Direct Food Additive. (5) Color Additive. (6) Food Contact Substance

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
A blend of nisin preparation, rosemary extract, salt, and sodium diacetate	Cooked (RTE) meat and poultry sausages and cured meat products	Not to exceed 0.25 percent of product formulation (where the nisin preparation will not exceed 250 ppm)	Acceptability determination	Listed by common or usual name in the ingredients statement (4)
Organic Acids (i.e., lactic, acetic, and citric acid)	As part of a carcass wash applied pre-chill	At up to 2.5 percent of a solution	FSIS Notice 49-94	None under the accepted conditions of use (1)
Ozone	All meat and poultry products	In accordance with current industry standards of good manufacturing practice	21 CFR 173.368	None under the accepted conditions of use (3)
An aqueous solution of peroxyacetic acid, hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP)	In poultry processing water, scalding, ice, spray applications, and as an acidifier in scald tanks as a scald additive	The level of peroxyacetic acid will not exceed 220 ppm, hydrogen peroxide will not exceed 110 ppm, and HEDP will not exceed 13 ppm	Acceptability determination	None under the accepted conditions of use (3)
Peroxyacetic acid, octanoic acid, acetic acid, hydrogen peroxide, peroxyoctanoic acid, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP)	Meat and poultry carcasses, parts, trim and organs	Maximum concentrations for meat carcasses, parts, and organs: Peroxyacetic acids 220 ppm, hydrogen peroxide 75 ppm; Maximum concentrations for poultry carcasses, parts, and organs: Peroxyacetic acids 220 ppm, hydrogen peroxide 110 ppm, HEDP 13 ppm	21 CFR 173.370	None under the accepted conditions of use (3)

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
A mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP)	(1) Process water for washing, rinsing, cooling, or otherwise for processing meat carcasses, parts, trim, and organs; and (2) process water applied to poultry parts, organs, and carcasses as a spray, wash, rinse, dip, chiller water, or scald water	In either application, the level of peroxyacetic acid will not exceed 230 ppm, hydrogen peroxide will not exceed 165 ppm, and HEDP will not exceed 14 ppm	Food Contact Substance Notification No. FCN 000323	None under the accepted conditions of use (6)
An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP)	Added to process water applied to poultry parts, organs, and carcasses as a spray, wash, rinse, dip, chiller water, low temperature (e.g., less than 40 degrees F) immersion baths, or scald water	At a level not to exceed 2,000 ppm peroxyacetic acid and 136 ppm HEDP	Food Contact Substance Notification No. FCN 000880	None under the accepted conditions of use (6)
An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) and optionally sulfuric acid	(1) Water or ice for washing, rinsing, cooling, or otherwise processing whole or cut meat, including parts, trim, and organs; and, (2) water or ice applied to whole or cut poultry including parts, trim, and organs as a spray, wash, rinse, dip, chiller water or scald water	In either application, the level of peroxyacetic acid will not exceed 220 ppm, hydrogen peroxide will not exceed 85 ppm, and HEDP will not exceed 11 ppm, measured prior to application	Food Contact Substance Notification No. FCN 000887	None under the accepted conditions of use (6)

(1) The use of the substance(s) is consistent with FDA's labeling definition of a processing aid. (2) Generally Recognized as Safe (GRAS).

(3) Secondary Direct Food Additive (4) Direct Food Additive. (5) Color Additive. (6) Food Contact Substance

### Table of Safe and Suitable Ingredients: Antimicrobials

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) and sulfuric acid	Red meat carcasses, parts, and trim	The level of peroxyacetic acid will not exceed 230 ppm, hydrogen peroxide will not exceed 75 ppm, and HEDP will not exceed 13 ppm.	Food Contact Substance Notification No. FCN 000951	None under the accepted conditions of use (6)
A mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP)	(1) Water or ice for washing, rinsing, cooling, or processing whole or cut meat including carcasses, parts, trim, and organs; and (2) water or ice applied to whole or cut poultry including parts, trim, and organs as a spray, wash, rinse, dip, chiller water, or scald water	In either application, the level of peroxyacetic acid will not exceed 220 ppm, hydrogen peroxide will not exceed 80 ppm, and HEDP will not exceed 1.5 ppm, measured prior to application	Food Contact Substance Notification No. FCN 000993	None under the accepted conditions of use (6)
An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP)	In process water or ice for washing, rinsing, storing, or cooling of processed and preformed meat and poultry products	The level of peroxyacetic acid will not exceed 220 ppm, hydrogen peroxide will not exceed 85 ppm, and HEDP will not exceed 11 ppm.	Food Contact Substance Notification No. FCN 001082	None under the accepted conditions of use (6)

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(3) Secondary Direct Food Additive (4) Direct Food Additive. (5) Color Additive. (6) Food Contact Substance

## Table of Safe and Suitable Ingredients: Antimicrobials

For a complete listing refer to FSIS Directive 7120.1 Safe and Suitable Ingredients used in the Production of Meat, Poultry, and Egg Products <http://www.fsis.usda.gov/OPPDE/rdad/FSISDirectives/7120.1.pdf>

SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP)	In process water used for washing, rinsing, cooling or otherwise for processing meat carcasses, parts, trim, and organs; and in process water applied to poultry parts, organs, and carcasses as a spray, wash, rinse, dip, chiller water, or scald water	The level of peroxyacetic acid will not exceed 220 ppm, hydrogen peroxide will not exceed 160 ppm, and HEDP will not exceed 11 ppm, measured prior to application	Food Contact Substance Notification No. FCN 001089	None under the accepted conditions of use (6)
An aqueous mixture of peroxyacetic acid, hydrogen peroxide, 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP), and optionally sulfuric acid	In process water or ice used for washing, rinsing, cooling or processing whole or cut meat including parts, trim, and organs; and in process water or ice applied to whole or cut poultry including parts, trim and organs, and carcasses as a spray, wash, rinse, dip, chiller water, or scald water	The level of peroxyacetic acid will not exceed 220 ppm, hydrogen peroxide will not exceed 80 ppm, and HEDP will not exceed 13 ppm measured prior to application	Food Contact Substance Notification No. FCN 001093	None under the accepted conditions of use (6)
An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP), dipicolinic acid, and sulfuric acid	Red meat carcasses, parts, trim, and organs	The level of peroxyacetic acid will not exceed 230 ppm, hydrogen peroxide will not exceed 75 ppm, and HEDP will not exceed 1 ppm, and dipicolinic acid will not exceed 0.5 ppm.	Food Contact Substance Notification No. FCN 001094	None under the accepted conditions of use (6)

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Potassium diacetate	Various meat and poultry products which permit the addition of antimicrobial agents, e.g., hot dogs	Not to exceed 0.25 percent of the product formulation	Acceptability determination	Listed by common or usual name in the ingredients statement (2)
A solution of water, lactic acid, propionic acid, and acidic calcium sulfate (solution with a pH range of 1.0-2.0)*	Various RTE meat products, e.g., hot dogs.	Applied as a spray for 20-30 seconds of continual application just prior to packaging *Propionic acid may be removed from the solution; sodium phosphate may be added to the solution as a buffering agent (the amount of sodium phosphate on the finished product must not exceed 5000 ppm.	Acceptability determination	Listed by common or usual name in the ingredients statement (2)
A solution of water, acidic calcium sulfate and 85-95,000 ppm of lactic acid (solution with a pH range of 0.35 to 0.55)	Raw comminuted beef.	To treat raw beef during grinding to lower the pH of the product.	Acceptability determination	Product must be descriptively labeled (2)

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## Table of Safe and Suitable Ingredients: Antimicrobials

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
A solution of water, acidic calcium sulfate, lactic acid, and sodium phosphate (solution with a pH range of 1.45 to 1.55)	Raw whole muscle beef cuts and cooked roast beef and similar cooked beef products (e.g., corned beef, pastrami, etc.).	Spray applied for up to 30 seconds of continual application *sodium phosphate on the finished product must not exceed 5000 ppm.	Acceptability determination	Listed by common or usual name in the ingredients statement of multi-ingredient products. Single ingredient roast beef products and raw whole muscle beef cuts must be descriptively labeled (2)
A solution of water, acidic calcium sulfate, lactic acid, and sodium phosphate (solution with a pH of 1.45 to 1.6)	Cooked poultry carcasses and parts.	Spray applied for 20 to 40 seconds of continual application * sodium phosphate on the finished product must not exceed 5000 ppm.	Acceptability determination	Listed by common or usual name in the ingredients statement of multi-ingredient products. Single ingredient whole muscle cuts of poultry must be descriptively labeled (2)
A solution of water, acidic calcium sulfate, lactic acid, and disodium phosphate (solution with a pH of 1.0 to 2.0)	Beef jerky	Applied to the surface of the product with a contact time not to exceed 30 seconds	Acceptability determination	Listed by common or usual name in the ingredients statement (2)

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## Table of Safe and Suitable Ingredients: Antimicrobials

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Skim milk or dextrose cultured with propionibacterium freudenreichii subsp. Shermanii	Meat and poultry sausages including those with standards of identity which permit the use of antimicrobial agents	Not to exceed 2 percent by weight of the finished product	GRAS Notice No. 000128	Listed by common or usual name in the ingredients statement -2
Sodium citrate buffered with citric acid to a pH of 5.6	Non-standardized and standardized comminuted meat and poultry products which permit ingredients of this type	Not to exceed 1.3 percent of the product formulation in accordance with 21 CFR 184.1751	Acceptability determination	Listed by common or usual name in the ingredients statement (2)
Sodium hypochlorite	Red meat carcasses down to a quarter of a carcass	Applied as a spray at a level not to exceed 50 ppm calculated as free available chlorine measured prior to application	Acceptability determination	None under the accepted conditions of use (1)
Sodium hypochlorite	On whole or eviscerated poultry carcasses	Applied as a spray at a level not to exceed 50 ppm calculated as free available chlorine measured prior to application	Acceptability determination	None under the accepted conditions of use (1)
Sodium hypochlorite	In water used in meat processing	Not to exceed 5 ppm calculated as free available chlorine	Acceptability determination	None under the accepted conditions of use (1)
Sodium hypochlorite	In water used in poultry processing (except for product formulation)	Not to exceed 50 ppm calculated as free available chlorine	Acceptability determination	None under the accepted conditions of use (1)

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Sodium hypochlorite	Poultry chiller water	Not to exceed 50 ppm calculated as free available chlorine (measured in the incoming potable water)	Acceptability determination	None under the accepted conditions of use (1)
Sodium hypochlorite	Poultry chiller red water (i.e., poultry chiller water re-circulated, usually through heat exchangers, and reused back in the chiller)	Not to exceed 5 ppm calculated as free available chlorine (measured at influent to chiller)	Acceptability determination	None under the accepted conditions of use (1)
Sodium hypochlorite	Reprocessing contaminated poultry carcasses	20 ppm calculated as free available chlorine Note: Agency guidance has allowed the use of up to 50 ppm calculated as free available chlorine	9 CFR 381.91	None under the accepted conditions of use (1)
Sodium hypochlorite	On giblets (e.g., livers, hearts, gizzards, and necks) and salvage parts	Not to exceed 50 ppm calculated as free available chlorine in the influent to a container for chilling.	Acceptability determination	None under the accepted conditions of use (1)
Sodium hypochlorite	Beef primals	20 ppm calculated as free available chlorine	Acceptability determination	None under the accepted conditions of use (1)
Sodium metasilicate	Component of marinades used for raw meat and poultry products	Not to exceed 2 percent by weight of the marinade	Acceptability determination	None under the accepted conditions of use (1)

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SUBSTANCE	PRODUCT	AMOUNT	REFERENCE	LABELING REQUIREMENTS
Sodium metasilicate	Raw beef carcasses, subprimals, and trimmings	A 4 percent (plus or minus 2 percent) solution	Acceptability determination	None under the accepted conditions of use (1)
Sodium metasilicate	RTE meat and poultry products	Up to a 6 percent solution applied to the surface of the product at a rate not to exceed 300 ppm of the finished product	Acceptability determination	None under the accepted condition of use (1)
Sodium metasilicate and sodium carbonate blend	RTE poultry products	Up to 15 percent of a solution of sodium metasilicate and sodium carbonate (sodium metasilicate not to exceed 6 percent) applied as a surface application at a rate not to exceed 700 ppm by weight of the finished poultry product	Acceptability determination	None under the accepted condition of use (1)
Trisodium phosphate	Raw poultry carcasses, parts, and giblets	See Q&A #15 for permitted level uses.	Acceptability determination	None under the accepted conditions of use (1)

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